How generative AI models such as ChatGPT can be (mis)used in SPC practice, education, and research? An exploratory study

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Abstract

Abstract Generative Artificial Intelligence (AI) models such as OpenAI's ChatGPT have the potential to revolutionize Statistical Process Control (SPC) practice, learning, and research. However, these tools are in the early stages of development and can be easily misused or misunderstood. In this paper, we give an overview of the development of Generative AI. Specifically, we explore ChatGPT's ability to provide code, explain basic concepts, and create knowledge related to SPC practice, learning, and research. By investigating responses to structured prompts, we highlight the benefits and limitations of the results. Our study indicates that the current version of ChatGPT performs well for structured tasks, such as translating code from one language to another and explaining well-known concepts but struggles with more nuanced tasks, such as explaining less widely known terms and creating code from scratch. We find that using new AI tools may help practitioners, educators, and researchers to be more efficient and productive. However, in their current stages of development, some results are misleading and wrong. Overall, the use of generative AI models in SPC must be properly validated and used in conjunction with other methods to ensure accurate results.